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Research Article

Macular Thickness in Cameroonians Sickle Cell Patients

Josiane Mare Njoya[1*], Godefroy Koki[2], Ouafa Cherkaoui[3]

[1]Regional Hospital of Garoua, Garoua, Cameroon; [2]Military Hospital of region number, Douala, Cameroon; [3]Specialties Hospital of Rabat, Rabat, Morocco

ABSTRACT

Introduction: Sickle cell disease is the most common genetic disease in the world. It is particularly prevalent in Africa south of the Sahara. In Cameroon. Several authors have described morphological changes from the macula to Optical Coherence Tomography-Spectral Domain (SD OCT) including the thinning of the predominant inner layers in the temporal area.

Methodology: This is a prospective analytic study. It was conducted mainly at the specialized ophthalmology department of the Army Military Application and Reference Hospital of Yaoundé (HMARAY) in Cameroon. Clinical ophthalmologic exam was done and biological parameters (rate of hemoglobin, electrophoretic quantification of S hemoglobin) registered from October 2016 to June 2017.We included: Any AS patient or Cameroonian SS patient who is 20 years of age or older; sickle cell patients AS or SS without intercurrent retinal pathology (strong myopia, diabetic retinopathy, vitreoretinal interface pathology).

Results: In our study the average age is 31 years. There is a predominance of female versus male sex ratio H/F=0.56. 84% of eyes had retinal lesions suggestive of non-proliferative retinopathy in the retina. The solar black spots were the most found retinal lesions (66.66%). Lesions were more localized temporally. In the OCT measurement, 60% of the eyes showed a decreased retinal thickness SD with 53% concerning the temporal retina. An hemoglobin level between 7 and 10 g/dl was found in 40% of our patients, 24% has severe anemia (hemoglobin<7 g/dl).

All our patients had a percentage of hemoglobin S greater than 80%. No decrease in visual acuity in our patients who had a decrease in retinal thickness at OCT SD.

Conclusion: There is a thinning of the retinal layers in SS Cameroonian sickle cell patients in the temporal region of the macula. Patients with retinal thinning are asymptomatic with preserved visual acuity.

Keywords: Sickle cells patients; Cameroonians; Macular thickness; OCT.

INTRODUCTION

Sickle cell disease is the most common genetic disease in the world. It is particularly prevalent in Africa south of the Sahara [1]. In Cameroon, four thousand children are born with sickle cell disease every year. Sickle cell retinopathy occurs in more than half of patients [2]. Several authors have described morphological changes from the macula to Optical Coherence Tomography-Spectral Domain (SD OCT) including the thinning of the predominant inner layers in the temporal area [3]. These modifications were found in asymptomatic patients [3].

It seems therefore appropriate to assess the central thickness of the retina in SS Cameroonian sickle cell patients and to establish, if possible, links with the biological and clinical parameters of these patients.

METHODOLOGY

This is a prospective analytic study conducted mainly at the specialized ophthalmology department of the Army Military Application and Reference Hospital of Yaoundé (AMARHY) in Cameroon from October 2016 to June 2017.Any AS or SS

Correspondence to: Josiane Mare Njoya, Department of Ophthlmology, Regional Hospital of Garoua, Garoua, Cameroon, E-mail: josianemarenjoya@yahoo.fr

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Cameroonian patient who is 20 years of age or older were included; sickle cell patients AS or SS without intercurrent retinal pathology (high myopia, diabetic retinopathy and vitreoretinal interface pathology). A full ophthalmologic examination was performed. The distance corrected visual acuity of each eye was taken on the Snellen scale at six meter and the near vision acuity on the Parinaud scale at thirty three centimeters. Refraction when necessary was done after cycloplegia for subjects less than fourthy years old with cyclopentolate 0.5% (one drop per eye every five minutes and taking refraction with the Nidek auto-refractometer thirty minutes after the last drop).Measurement of intraocular pressure by the Top con air jet tonometer. The slit lamp examination of the anterior segment was done. The fundus was made using the Goldman 3-Mirror glass after dilation with a 0.5% tropicamide mydriatic. Retinal thickness measurements were made using a Nidek RS-3000 Advance tomograph. The thickness was measured by the macula map ETDRS (Macula Map) made of 9 fields composed of 3 concentric circles of 1 mm, 3 mm, and 6 mm in diameter. The measure interpreted ranged from the internal limiting to the layer of the pigment epithelium. The thickness is given in micron meters. For the thickness graph the comparison with the normative base data is displayed on the color scale. This normative basis is set for patients aged 20 to 79 years. The color code taken into account is that validated in the tomograph used. The thinned areas were displayed in blue, the normal thickness areas in green and the thickness areas increased in red and yellow. The gray zones were those not taken into account by the data of the normative base. Analysis of the OCT structures in section studied the presence or not of all the retinal layers, the analysis of the morphology of each layer. The normative basis data are adjusted for patients aged 20 to 79 years. The OCT test was interpretable when the Signal Strengh Index (SSI) was greater than or equal to 7/10. Biological data from patient records were: hemoglobin level (the patients were considered to have severe anemia for a hemoglobin level <7 g/l, a moderate anemia between 7 and 10 g/dl, a mild anemia at more than 10 g/l according to WHO). The percentage of hemoglobin S after quantification and fragmentation by electrophoresis was noted. The data were entered and analyzed by Epi info version 7.2 software. To establish the correlations between the data, we used the odd ratio tests with confidence interval around the OR to estimate the association between the data and the tests. Chi - two of Pearson, Fischer and Fischer exact to determine the significance for a p-value <0.05.

RESULTS

In our study the average age is 31 years. There is a predominance of female versus male sex ratio H/F=0.56. 84% of eyes had retinal lesions suggestive of non-proliferative retinopathy in the retina. The solar black spots were the most found retinal lesions (66.66%). Lesions were more localized temporally. In the OCT measurement, 60% of the eyes showed a decreased retinal thickness SD with 53% concerning the temporal retina. An hemoglobin level between 7 and 10 g/dl was found in 40% of our patients, 24% has severe anemia (hemoglobin <7 g/dl). All our patients had a percentage of hemoglobin S greater than 80%. No decrease in visual acuity in our patients who had a decrease in retinal thickness at OCT SD.

DISCUSSION

During the OCT measurement, 60% of eyes presented a reduced SD retina thickness with 53% concerning the temporal retina. This predominant localization of the reduction in the thickness of the retina was found by Raeba et al in London in 2015 in 107 sub-Saharan African and Afrocaribian patients whose age was between 18 and 74 years old [4].This thinning is more found in the temporal macular region in African and Caribbean patients [4].

Minvielle et al in a series of cases of 9 sickle cell patients aged 19 to 54 years noted during the examination by the OCT-A the existence of more marked microvascular anomalies of the temporal perifoveolar region concerning the superficial and deep capillary plexus [5].

Indeed, OCT SD and OCT -A are the two recent non-invasive retinal imaging techniques used that can demonstrate subclinical macular damage secondary to ischemia [5].

A hemoglobin level between 7 and 10 g/dl was found in 40% of our patients, 24% had a severe anemia (hemoglobin level <7 g/dl). Severe anemic syndroms constitute 24% of the systemic complications of sickle cell anemia in our patients [6].

All of our patients had a hemoglobin S percentage greater than 80%.We did not find a correlation between the presence of retinal lesions of non-proliferative sickle cell retinopathy and the decrease in the thickness of the retina. However,Daniel A Palh et al. study done in 2015 notes that a discreet thinning of the macular a retrospective region is significantly associated with the presence of proliferative sickle cell retinopathy [7].

We did not note a decrease in visual acuity in our patients who presented a reduction in the thickness of the retina at OCT SD. Indeed, the etiology of retinal thinning found at OCT SD n is not fully understood and the functional consequences have not yet been elucidated [7].

CONCLUSION

There is a thinning of the retinal layers in SS Cameroonian sickle cell patients in the temporal region of the macula. Patients with retinal thinning are asymptomatic with preserved visual acuity.

REFERENCES

1. Serjeant GR, Serjeant BE. Sickle cell Disease. Oxford University Press.2001;ed:3.
2. Report of the 60th session of the WHO Regional Committee for Africa. Malabo, Equatorial Guinea. 2010;1-2.
3. Han IC, Tadarati M, Pacheco KD, Scott AW. Evaluation of macular vascular abnormalities identified by optical coherence tomography angiography in sickle cell disease. Am J Ophthalmol. 2017;177:90-99.
4. Mathew R, Bafiq R, Ramu J, Pearce E, Richardson M, Drasar E, et al. Spectral domain optical coherence tomography in patients with sickle cell disease. Br J Ophthalmol.2015;99(7):967-972.

5. Minvielle W, Caillaux V, Cohen SY, Chasset F, Zambrowski O, Miere A, et al. Macular microangiopathy in sickle cell disease using optical coherence tomography angiography. Am J Ophthalmol. 2016;164:137-144.
6. Dokekias AE, Nzingoula S. Profile of the subject sickle cell homozygous after the age of 30 years. Black African Med. 2001;48:10.
7. Pahl DA, Green NS, Bhatia M, Chen RW. New ways to detect pediatric sickle cell retinopathy: a comprehensive review. J Pediatr Hematol Oncol.2017;39(8):618.